Security Storage Containers: Design, Construction and Concealment

By

R. A. Johnson

SECURITY STORAGE CONTAINERS:

DESIGN, CONSTRUCTION AND CONCEALMENT

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R. A. JOHNSON

ABOUT THE AUTHOR

In the late sixties, the Author read the "signs of the times", ended a career of nearly twenty years as a research scientist involved in military weapons systems research and development to relocate to a remote ranch where he and his family live a self-sufficient life (as near as is practical).

On a full-time professional basis, the Author is a contract writer, lecturer and consultant specializing in physical survival, security and related topics. He manufactures and sells security products of the type described in this booklet. Too, he is Survival Editor for Inflation Survival Letter. Comprehensive security/storage consulting services are available.

This booklet is not exhaustive in its treatment of a complicated technical problem and is not a scholarly work full of technical terminology. It is intended as a practical guide for practical people to use in assuring optimum storage and concealment of valuables and other items.

Second Printing: October, 1977

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Dripping Springs, Texas 78620
(512) 264 1675
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Price: $5.35

INTRODUCTION

Never underestimate the intelligence, resourcefulness and perseverance of thieves and looters. They have always lived off the accumulated savings of people who work and produce; they have breached the security of the pyramids of Egypt and the Great Wall of China and have proceeded to loot and pillage kings, states, and the strongest institutions. Times have not changed; crime is perhaps approaching an all-time high and is a major factor in the insecurity which besets us all. FBI statistics indicate that thieves commit about 2,345,000 residential burglaries each year -- about one every fifteen seconds.

Thieves represent all levels of society; some are amateurs and simpletons; some are sociopaths, psychopaths and madmen. Then there are those thieves who read articles on security, attend trade shows, solicit technical data from manufacturers and research you and your assets. Some criminals are organized into highly competent professional groups.

One of the most serious and disquieting factors which must be related to personal security considerations is the prevailing political and social attitudes and their effect on civil and criminal violence in general. Socialist and other collectivist pressures on our society are increasing; the concept of personal and private property is becoming more unpopular and increasingly large numbers of Americans are becoming accustomed

to living off the industry and wealth of others. Such people covet what you have and are being educated to believe that your accumulated assets are rightfully theirs; a new class of criminal has appeared -- the ideological/political criminal. This ideological/political criminal is motivated to destroy existing capitalist society and utilizes crime as a revenue source to finance his revolution through theft, burglary, extortion, kidnapping and other terrorist criminal acts. These people do not steal and rob simply to live; they resort to crime to harass and punish what they consider to be an "enemy" and to weaken the system by "taxing" wealth and raising the level of apprehension and violence.

You must realize that there is no absolute protection from thieves and the violence which often accompanies them; anything you can purchase and install, any plan you can devise, any service you can buy is available to others including thieves. In protecting your assets, the single most important decision that you can make is to accept personal responsibility for safeguarding your own assets. The only way a criminal gains access to information describing your assets is with your help; the only way a thief can know your assets is for you personally, your agent, your employee, your associate or friend, or a member of your own family to tell them -- there is no other way except a random probe and many times thieves do not operate in this fashion.

Thieves do not usually select victims at

random; often they precisely identify what they are after and perhaps have already pre-sold their loot. Another source of information describing your assets is through people who are in positions to observe assets and to assess the difficulty of getting to them: meter readers, mailmen, deliverymen, garbagemen, bank employees, envious or disgruntled employees, or employees who pick up extra cash on a regular basis by tipping off full-time criminal associates. Probably the single most effective informant is the domestic employee; these people are poorly paid, exposed to expensive tastes which they cannot hope to satisfy, are usually held in low esteem, and usually live in social conditions which expose them to criminal exploitation, intimidation, extortion and threats. Too, domestics are usually treated, at a superficial level, as if they were members of the firm or family and are privilege to your most intimate affairs.

Probably the most common way assets are called to the attention of thieves is the large number of people who have a need to display their assets by living a lifestyle befitting a grandee; such profligate affluence will ultimately gain you the attention of a thief or thieves.

When planning the security and storage of valuable assets, ideally you should plan and install everything yourself. As a practical matter, most of us will have to have some help -- unfortunately some jobs are beyond the capability of an individual. You can minimize or perhaps essentially

eliminate such limitation if you deal only with those you trust implicitly and are even then wary of extending more trust or more detailed information than is absolutely necessary. My advice is to be absolutely candid with no one -- always reserve some guile or subterfuge. Do not burden a friend or a member of your family with details or burdensome particulars. Whomever you ask for help, a professional, a friend or a member of your family should not be concerned with nor burdened with knowledge of whether you plan to store precious metal, negotiable securities, firearms, or nasty pictures.

If you decide to produce one of the containers described in this booklet and you are dealing with machine shops, concrete contractors, etc., try not to stimulate any normal curiosity they express. It is better to have storage containers of the type we are discussing fabricated outside your immediate neighborhood or community. To avoid calling attention to your purpose, describe what you are seeking to have built in prosaic terms -- for example: "a pressure vessel", a sump for the disposal of toxic chemical wastes and so on. I have installed several Security/Storage Cannisters in concrete slabs or in basement floor and walls and have successfully satisfied the curiosity of contractors and concrete deliverymen with the explanation that the cylinder was a storage dump for photographic and other chemicals and that the contents of the cylinder were "micropore", "sintered metallic", or "ceramic" filters. Too, I have sold Security/Storage Cannisters and other

such merchandise to purchasers who pay cash and do not ask for receipts; other local purchasers buy cannisters, pay cash, ask for "open" or "bearer" purchase orders, and pick up their merchandise themselves (thus avoiding identification and records).

The point I am stressing is that you must resist the natural temptation to brag about or even discuss security matters with anyone. It is a widely distributed human fault to want to extend confidences and to educate any listener. Keeping your mouth shut is the most successful technique I know for preserving confidential information -- but it is not the easiest.

UNDERGROUND STORAGE

Through the ages, the ultimate in concealment of valuables has been burying in the earth -- we are still discovering treasures dating back to the dawn of recorded history. By using modern materials and techniques, it is relatively simple to protect assets from physical deterioration and the attention of plunderers for great periods of time.

I have personally observed the effects of military invasion and occupation of modern cities; I observed first hand the destruction of large areas north of the Capital in Washington, D. C. during the black riots of the sixties; I have personally inspected the aftermath of the Watts Rebellion; I have personally interviewed many

people who have been forced to secrete their assets and have discussed with them the difficulties in recovering their property. Too, I have a literary acquaintance gained by studies of such problems in past periods of civil and social disorder. This experience recommends ideally the burying of assets in gardens or undeveloped land if possible because the real estate of cities can be completely reorganized when rebuilding takes place and landmarks may not then be recognized easily. Fire, explosive demolition, military ordnance, reconstruction, looters and pillagers in the past have been known not to leave much of a city intact.

The Optimum Security/Storage Cannister:

One of the very best and most practical long-term storage container may be produced by cutting the top from a standard oxygen gas bottle, welding a flange to the top, fitting a "blank-off" plate or lid to that flange and sealing the lid with a coat of plastic gasket material (available at auto supply outlets), an o-ring gasket seal and six stainless steel cap screws. The complete cylinder should be glassbead or sand blasted, acid etched and phosphate conversion coated to provide a good priming surface for two coats of epoxy enamel paint. Sealed in this fashion, such a container and its contents should last for hundreds of years, depending on local conditions -- considerably longer than most of us are interested in.

The optimum storage life of this container

can be insured, and corrosion for all practical purposes can be eliminated by encasing the cylinder in 4 to 6 inches of concrete (which is the best protection for steel underground). For storage aboveground, a coat of pitch or roof-paint should be more than adequate. Following this procedure, you need not concern yourself with any exotic corrosion control techniques such as "solution pressure" considerations, "cathodic protection", "ph of soil or ground water", etc.

A standard oxygen gas bottle (available from welding suppliers) measures approximately 9.06 inches in diameter, is 56 inches high, weighs about 134 pounds and costs about $135.00; the flange and "blank-off plate" should cost about $100; surface preparation and paint should cost about $50.00; shop time and labor should cost about $100.00 for a total cost of about $410.00. Like many simple jobs, welding flanges to the top of a gas bottle and machining the mating surfaces of the blank-off plate and the flange accurately enough so that the weld does not break when all the closure bolts are tightened, is not an easy task. However, any good shop with modern welding equipment and a lathe of adequate capacity (12" or greater), should not have serious difficulties with this work. These prices are based on an order of a minimum of ten units from a local shop where I have let many orders over a period of several years; too, I take delivery as the units are completed allowing the shop to fit my orders into their production schedule. The price of a single unit may be as much as 50% to 75% higher since the shop's set-up time

is the same for an order or one or many. So if practical, you may want to get friends to go in with you in order to get quantity price breaks.

Utilizing scrap gas bottles would be a way to cut costs if there were a dependable source. However, regulatory agencies require pressure testing and re-certification of gas bottles on a 5-year regular basis; gas bottles which do not pass the re-certification tests due to the presence of holes or other defects must be destroyed before they are sold for scrap and must not be modified or sold intact. Many sizes of gas bottles are manufactured, but the standard size is far easier to locate. Stainless steel gas bottles in standard size, 8 inches diameter and 27 inches high are available at a much higher price, and I recommend them only if you have a special corrosion risk such as saltwater or corrosive environment. You also might consider containers such as small fire extinguishers to modify along these lines.

Figure 1, in the last section of this booklet, describes the Security/Storage Cannister in detail.

To protect the contents of a sealed Security/Storage Cannister, you may fill and seal the container on a very hot and dry day; you may fill and seal the cylinder in an air-conditioned low humidity room; you may place a small piece (1/4 pound) of "dry-ice" inside (check local phone book for source), allow it to evaporate completely thus releasing dry and inert CO_2 and then seal the container (however, in the presence of moisture, be

careful as "dry ice" may freeze and trap this moisture in your container unless you "charge" your cannister on a hot dry day or in a dry air-conditioned atmosphere); or better yet, buy or rent a small cylinder of nitrogen gas from a welding equipment supplier and fill the cylinder with dry and inert nitrogen gas which is an ideal atmosphere for long-term storage. Since both CO_2 and nitrogen are heavier than air, you can fill the cannister while it is standing upright and seal the closure bolts. I do not recommend the use of automotive type air valves for storage pressurization as they are short-lived. Any metal objects placed in the cannister should be coated with oil or heavy grease as an added precaution against corrosion -- as a matter of fact, you could completely fill the cylinder with a good grade of oil and forget the inert gas protection techniques. Such precautions against moisture induced corrosion as "silica gel" and vapor phase inhibitor (VPI) are practical, and such products are available from large hardware stores or sporting goods stores which sell firearm supplies.

Some general precautions to observe when storing anything for long periods of time, especially underground or in sealed containers, include: do not store moisture absorbent materials such as paper, fiber or cloth in such a manner that they may contact stored metallic objects thus enabling ambient moisture to be retained or even concentrated and cause corrosion (especially be careful not to allow any dessicant material such as "silica gel" to come in direct contact with

stored items); be careful to store materials which might corrisively interact in separate containers (e.g., dissimilar metals such as gold, silver or copper which may under certain conditions electrochemically dissolve each other in presence of moisture); do not store foods, household chemicals, fuels, solvents, medicines, reducing agents, oxidizing agents, bleach, and so on together or with any other type material; do not store firearms and ammunition (or ammunition components) in the same container since the natural decay or aging process of propellant powders may produce corrosive fumes; do not store materials which expand thermally in sealed containers where they may generate bursting-level pressure.

The Security-Storage Cannister should be buried not less than one foot below the surface of the earth; a hole may be dug using a hand auger and "dirt lifter" or "post-hold digger"; a portable power auger (available from rental tool suppliers or contractor's supply outlets) or a farm tractor with a power auger are ideal. Where stone is near the surface, you may require the use of a rock bar (available from rural hardware stores or from building contractor's suppliers). If the soil in your area is underlain by hard rock, you may be forced to hire the services of a drilling company or even an excavation blaster.

To secrete a Security/Storage Cannister in basement floors or walls, is considerably easier than you would believe (unless you live where hard rock is near the surface). Simply use a one-half

inch masonry bit or a "star" drill and a hammer to drill through the concrete (seldom more than four inches thick unless you try to penetrate a cross-beam) in a circular pattern, break the concrete with a heavy hammer and use an auger, rock-bar and "dirt lifter" to remove the debris. A steel reinforcing bar may be cut with a chisel should you happen to encounter one. The hole should be a minimum of six inches larger than the Cannister to provide adequate space for concrete or mortar. You can place the top of the Cannister at floor level, replace the carpeting and place a large piece of furniture over it. If what you are storing is very valuable or might get you in trouble if discovered, set the top of the Cannister two or more inches below floor level, cover the top with a sheet of protective plastic film and fill in the space with mortar-mix. If you pre-soak the old concrete work and keep the new mortar damp for a few days, a trowelled surface is impossible to detect. An irregular shaped patch is less obvious. To re-enter such a Security/Storage Cannister, all that is required is to strike a few blows with a hammer on the mortar and remove it to gain access to the retaining bolts and cover. For more convenient access, a removable concrete plug could be fitted over the opening under a rug or a piece of heavy furniture.

The easiest way to place a Security/Storage Cannister in concrete is for two men to lower it in place with a steel bar through an eyebolt (if it is full, you will need a hoist), being careful to secure it well as the cannister will tend to float

out of the concrete.

Another Practical Security/Storage Container:

Another practical long-term underground storage container can be converted from a standard steel storage tank such as a household propane or butane tank modified by cutting an access hole, welding an entrance collar and flange and fitting a sealed lid. This work should cost two or three hundred dollars, and the tank should cost about one dollar for each gallon capacity. Be sure to provide corrosion control treatments as outlined for the Security/Storage Cannister. These tanks are available in sizes that range from 250, 500, and much larger. I recommend doing this modification yourself or taking the work to a shop outside your neighborhood and thinking up a good story to explain your need for such an item. The only problem with above-ground bottled gas storage tanks is that they must be securely anchored as thieves have been known to steal the tanks for the gas contents.

Plastic Security/Storage Containers:

For less permanent, short-term storage some security consultants recommend the use of ABS type plastic soil, wastewater or drain pipe. This material is very inexpensive compared to steel containers, can be cut and sealed (following directions printed on adhesive label) in the home workshop, and is readily available from hardware or building suppliers. Another advantage of using

plastic is that it is non-metallic and will not be detected by a metal detector; however, if the contents are metallic, this is of little practical significance. Pipe is available in sizes through six inches, and close fitting endcaps or closures to seal the ends are available. Simply cut off a section adequate to contain your assets and affix the end caps using the cement or adhesive that comes with it. There are other plastic type pipes, but ABS is the only material I am familiar with which does not outgas excessive corrosive fumes or solvents -- even so, you should isolate the contents from the walls of the pipe and especially from the cement adhesive by using polyethylene (Glad Wrap from your grocery) or polyvinyl chloride film (Saran Wrap). Too, protect the plastic pipe from petroleum derivative, organic material and solids which will result in plastic deterioration. The "Seal-A-Bag" (a Hamilton Beach product) is a convenient sealing system for plastic and is available at hardware stores.

Figure 3 in the last section of this booklet illustrates this container.

SECURITY CHESTS AND VAULTS FOR THE HOME

The conventional safe was not designed to serve the need we are anticipating; it is very expensive, very obvious and impressive, easily moved, easily peeled or blown, is not water tight and was obviously suited to more honest times. Safes are usually constructed of heavy sheetmetal

and lots of concrete to provide mass. A conventional safe constructed of heavy steel plate, which is hardened so that it cannot be easily drilled, and perhaps of material resistant to torch cutting would cost thousands of dollars. I would consider it practical only if it were concealed and actually built into masonry walls, concrete floors, etc. Since most safe closures are not watertight, they are not satisfactory anywhere water is likely to collect and for this reason are not suited to long-term storage.

Security/Storage Chests:

For clients who must secrete or store valuables about their homes, especially those who live in apartments or mobile homes and cannot make structural modification, I have designed heavy storage vaults or chests which I recommend as the optimum storage container for this application. I have seen such containers used in under-developed countries where police protection was unavailable and where they represented the best protective measures available when all you can do to insure security is to conceal your valuables in the most formidable, heaviest, ugliest container you can find. When you choose to be away from home, you can place a lot of expensive equipment such as cameras, sporting equipment, electronic equipment, etc. in such a Security Chest and enjoy your time away from home with considerably less worry about your possessions.

The Security Chest may be connected to your burglar alarm system, or you may put a battery

and a fire bell inside the chest so that any movement will set it ringing -- to the consternation of a burglar.

Figure 2 in the last section of this booklet illustrates this container.

These chests are large enough to put a lot of valuables into as they measure (inside) 20 inches deep, 14 inches high, and 48 inches long. When fitted with an upholstered cushion and slip cover, they appear to be a small couch. They are constructed of heavy (1/8 inch) cold rolled steel, fabricated as nearly as possible from one piece, and have welded seams, concealed covered hinges and hasps (difficult to cut with a torch or bolt cutters). Manufacturing tolerances are so close that the fit of the lid to the chest walls is so tight that it is almost impossible to get a pry-bar or hydraulic jack into the seam to force the lid, and there are no handles or convenient flanges to afford a grip for moving. The chest weighs 170 pounds empty; when filled with your possessions and perhaps a ton of lead shot, bricks or sand, it can weigh several tons. Unless a burglar has a winch or a torch, he is going to have a hard time with this chest. The Security/Storage Chest can be bolted to a floor or wall. Too, the chest can be made from stainless steel (at a considerable increase in cost) which is nearly impossible to cut with a torch -- it just turns black and blows metal into the cutting torch to cut it off.

Two heavy padlocks with hardened cases and

shanks should be used to secure your chest. These locks by design are difficult to get to -- even for you to unlock with a key. Such locks are manufactured by Medoco Security Locks, Inc., U.S. Route 1, 11 West, Salem, Va. 24153, and I recommend you contact them for the name of a local dealer.

This security chest unlike the conventional safe is not intended to be seen and when fitted with an upholstered slipcover appears to be a sofa or couch. You should be able to locate a sheetmetal shop or an electronic cabinet manufacturer who has the equipment to build such units.

Any shop with a four foot capacity metal brake and shear can handle such a job. The top of such a chest should be folded from one piece of steel with only the ends welded in; the back, bottom and front of the chest should likewise be folded from one piece of metal and the ends welded in place. A storage chest constructed to these specifications should cost about $400.00.

Practical Short-Term Security/Storage Containers:

The most practical containers for short-term above-ground storage (up to 2 or 3 years) are government surplus ammunition cannisters, instrument storage drums, artillery powder storage cannisters, artillery projectile or rocket launcher tubes; all these containers are constructed to expensive military specifications, complete with heavy neoprene gaskets and secure fasteners. All

these items are available from your local army-navy surplus outlet at a price which represents a minute fraction of original or replacement cost. When these storage containers are gone, there will be no comparable storage containers on the market.

The standard commercially available 55-gallon drum (which costs about $15 or $20 used) is hard to beat when fitted with the neoprene gasket and the drum sealing band that comes with it. It should last 5 to 10 years when stored out of direct contact with rain, snow and the sun. A precaution regarding outside storage of metal drums or containers must be observed: cover or insulate them from direct sunlight as the changes in air pressure due to thermal expansion and contraction causes an audible "pop" and "snap" of the metal drum.

CONCEALED STORAGE AREAS

Modern construction affords very few really concealed storage areas and little protection from a search by looters and pillagers. The floor slab is the only permanent part of such a home. An ordinary method of searching for hidden storage areas is to simply destroy the house. A burglar with only a sledgehammer or a heavy pry-bar can literally destroy a conventional frame building -- the only reason he will not do so is because he is either too lazy or does not have the time. He is usually in a hurry and will hesitate to make a search of this thoroughness unless he is reasonably sure that you have in fact stored valuables in your

home. There is little you can do to prevent such destructive searches other than be innovative in hiding your assets,or you may so encumber the asset in massive concrete or other construction thus forcing a thief to use expensive and cumbersome equipment such as jackhammers, bulldozers, winches, etc. Even a looter who has the experience and the equipment of a general building contractor, who has reasonably precise information describing your assets, who is familiar with construction techniques, and who has lots of time may be foiled.

A relatively large storage area may be obtained by closing off 3 or 4 feet at the end of a room or perhaps the rear of an enclosed garage with a new wall. A standard frame wall with studs spaced on 16 inch centers will completely seal off the storage area, and then the whole room should be repainted. Inconvenient access should be provided through an attic trapdoor and a ladder. This storage area is completely weatherproof and all utilities are available. The area is convenient for inspecting or using the stored materials -- such as freeze-dried foods, for example. The most important design consideration is to avoid any clues or cues to the existence of a storage area, such as a wall that is obviously too thick. This construction should be within the capabilities of many home handymen.

Another storage area can be provided by cutting through the siding or paneling of an inside wall and placing shelves between wall studs, then recovering the opening with a new sheet of paneling.

You can cover the opening with a floor length mirror and gain access by removing the mirror perimeter screws or by smashing the mirror if you are in a hurry. This area is only 4 inches thick -- but that can hold a lot of things. You can remove wood floor panels and gain similar storage space. You should consider the use of "hidden hinges" which are readily available from hardware stores. However, these storage areas are so well known that you must be very careful in concealing evidence of their existence.

False air-conditioning and heating ductwork is an inexpensive way to store a large volume of material -- you can gain access through a false ventilator.

A length of sewer or vent pipe, sealed at both ends forms a storage container which should attract no attention when concealed inside a wall, appearing to be a vent for waste passing through your living quarters. You can have the pipe cut for a close fit by a plumber or a hardware store and adjust its length by loosening the couplings for a tight floor-to-ceiling fit.

Attic space and below floor crawl space are popular places to store valuables in containers such as Security/ Storage Cannisters or Chests. The advantages of such spaces as storage are their general unwholesome atmospheres: crawlspace especially, is wet and full of insects; the attic is more readily entered but is hot in summer and cold in winter -- its insulation is cover for a

lot of storage. The primary disadvantage of these potential storage spaces is their reputation for being hiding places. If you are reputed to possess valuables, these places will be searched. Too, your valuables will have to be weather sealed as these spaces are essentially open to the weather and changes in temperature and humidity can cause rust and corrosion.

Stone or masonry construction lend themselves to security storage; it is very easy to remove a brick or stone and chisel a place behind them and remortaring the "cover". A few inches of mortar can conceal a lot, or a coat of paint will cover a lot of work. Your local library is a source of masonry and mortar "how to do it" information.

MORE CONCEALMENT

A salvaged hot-water heater may be readily converted to a storage container. Pry off the top sheetmetal cover, remove the external plumbing fittings and lift out the water tank inside. Have the top bandsawed off or do it yourself with a hacksaw; provide some sort of closure (for example, a hinge and hasp); replace the tank in the sheetmetal cover, replace the plumbing fittings and insulation and replace the sheetmetal top cover. You can actually install this tank, complete with fake piping, and it will appear to be a functional water heater. Too, you can simply toss it in the rear of your garage. Who would steal such an item? Other appliances are as easily converted.

Even though most people will object to their premises looking like a junk yard, a derelict automobile in your back yard has a weather-tight trunk which can be used for short-term storage of a lot of equipment. The auto should not be easily moved -- you might remove the wheels to make sure. The auto should have no obvious scrap value or any collector value. A scrap automobile today is not worth what it would cost to carry it off, and in most communities you could not sell it for scrap without a valid title. The engine, transmission and rear-end of an automobile can be used as a package for lots of valuables by removing heads or inspection covers and closing off all openings for a more weather-tight container. These items should be obvious trash. They should be old models, and you should knock holes in the engine blocks so no one will steal them.

A functional septic tank is a good place to store a well-sealed container. This is a short-term storage area since it is a corrosive environment; however, a fake septic tank would not have such a limitation.

Short-term storage can be provided by ordinary items such as paint cans, canned food, etc. For example, several rolls of KrugerRands and a DeBeers Precious Stone Investment Packet would fit inside a large peanut butter jar.

Valuables have been stored often in concrete or plaster of paris art objects -- they should not be attractive enough to carry off. Too, fake wall

sockets, fake light switches, holes cut behind floor moldings, fake door bell housings may be used.

METAL DETECTION COUNTERMEASURES

When planning for security storage of valuables, the use by thieves and treasure hunters of electronic and other metal detecting equipment must be considered. It is not possible to provide a quick and dirty solution to the problems involved in designing countermeasures to foil the pillager or treasure hunter who knows how to use and has access to modern detection technology. There are many variables to consider: (1) the physical nature of the treasure, material, mass, volume, magnetic characteristics, etc.; (2) the nature of the soil composition and the depth of the water table at the site; (3) the sophistication of the detection countermeasures employed; (4) the technical sophistication, competence and economic resources of the searcher; and (5) does the searcher know what he is looking for?

Instruments and Detection Techniques:

Several types of instrumentation are available to locate buried or hidden metallic objects. These devices range from the cheap and simple to the incredibly expensive, exotic and complicated. The most common "metal detectors" are electronic instruments based on the principle that a radio-frequency oscillator will change frequency when its search coil or probe is brought near a mass of metal. The sensitivity of this instrument,

depending on quality and the experience of the user, is from a few inches to a few feet. This instrument ranges in price from about $50 to $1000 and is within the reach of most thieves.

There are instruments of much greater technical sophistication and sensitivity -- but all are so very expensive and so technically complicated as to be available only to governments, armies, industrial organizations and university laboratories.

Magnetometers detect variations in the earth's magnetic field due to non-uniform concentrations of intervening materials in the earth. Most such devices are not designed to be used as treasure detectors; they are used to locate large scale geologic features such as mineral deposits. Their use requires well trained, competent technicians, complicated grid pattern mapping, sampling, and layout techniques. Such instruments cost from $10,000 to as much as hundreds of thousands of dollars.

Gravitymeters detect differences in the earth's gravity field, and the data generated through the use of this instrument, too, must be collected through the use of precise grid pattern survey techniques and plotting the results to disclose magnetic anomalies. These instruments cost from $30,000 to several hundred thousand dollars.

Exotic and incredibly expensive detection techniques make use of such instrumentation as gas chromatography and scintillation sampling

techniques to detect the presence in minute quantities of inert gases such as radon, argon and others. Such gases are present when soil is disturbed -- for example by digging a hole. These detection devices were developed by the introduction of nonmetallic explosive devices in modern warfare. All these technologies require highly skilled technicians and usually laboratory facilities -- none of which is available to the thief or ordinary looter. A simple countermeasure for such instruments would be to dig lots of other holes in the area of your trove.

In general, the larger the mass of metal, the deeper it must be buried to escape detection by a metal detector -- a $1,000 bag of silver coins buried at a depth of one meter is for all practical purposes not detectable with conventional metal detecting equipment. Following these countermeasures, you need not worry about metal detection techniques.

The primary problem with using metal detecting equipment is that there is so very much metal to detect. Anywhere man has been, there is an incredible amount of metal fragments, metal oxides, etc. I have searched areas so ancient that all traces of habitation other than ceramic fragments have decayed from the surface, and yet a detector will respond to subsurface metallic objects with such frequency as to work you to death. It is impossible to dig or otherwise follow up every detection signal you find. Even if the treasure you seek is in an isolated area and you know

what and where it is, it is not easy to find a hidden object. I have, for the past ten years (off and on) been searching with very good metal detecting instruments for a known cache. Nearly fifty years ago, a relative left his death bed to hide $500 in twenty dollar gold pieces between a back door and a barn about thirty yards away. I have systematically searched the whole area and have recovered an incredible amount of absolute trash. All I have to show for all this work is ruined rock walls, holes and junk. It is discouragingly hard work to locate forgotten water pipes, food tins and bits and pieces of old autos and farm equipment.

There are many effective countermeasures for foiling detection by all these instruments; however, for all practical purposes the instruments against which protection is needed is the simplest and most insensitive type -- the "radio-frequency", "beat-frequency", "variable oscillator", or the "induction balance" type. The sensitivity of these instruments decrease very quickly with depth and distance; detection sensitivity decreases as the square of the distance from the search probe or coil to the search object. The return signal is inversely proportional to the distance. For example, if you bury a metal object 2 feet below the surface, the return signal is diminished to 1/4 intensity, 4 feet diminishes the signal to 1/16, 10 feet to 1/100, and 100 feet to 1/10,000. This sensitivity characteristic of metal detectors means that a large metallic object buried deep in the earth provides a much smaller return signal to a metal detector than a

much smaller metallic object just a few feet closer to the search probe or coil near the earth surface. These metal locating instruments cannot distinguish between metallic objects of the same physical nature -- two objects of the same mass give the same magnitude of return signal. For example, a Security/Storage Cannister weighing 140 pounds buried three feet below the surface causes a return signal of the same magnitude as a mass of metal weighing 35 pounds buried one foot deep. All this makes it obvious that a very small amount of scrap metal buried at shallower depths in the vicinity of your Security/Storage Cannister would seriously interfere with a metal detector -- in short, using these containers, you can drive a searcher with a metal detector crazy. There is no way to ascertain which signal represents a treasure and which is representative of a decoy except by eliminating every decoy by digging it up and discarding it. This time consuming and laborious task would be practical only if a searcher knew that the treasure was worth the effort of heavy equipment searching.

You can make detection very nearly impossible for all practical purposes if you bury your cannister three feet deep and place several decoys at varying depths and near the surface about the area. These decoys can be bits and pieces of old tools and machinery, trash, or finely divided metallic particles such as grinding waste or lathe turnings from a machine shop. Too, decoys should be consistent with the location. Finely divided particles do, however, dissipate in time,

and if you do use such materials, you should replenish the supply every few years.

One of the best subterfuges is to bury a Cannister a foot or so directly beneath a large metal corner fence post. A metal detector search probe cannot be brought within range of the Cannister, and the return signal from the metal post is very much stronger than the Cannister return. Too, the post is an excellent reference.

If you are intimidated by such semi-technical considerations and choose not to clutter your mind, countermeasures may be summarized: (1)Bury a well sealed Cannister in an isolated or unlikely location. (2) Bury the Cannister in an upright position at least 3 feet below the surface (more if practical) and no less than 1 foot deep. (3) For each 100 pounds of Cannister and contents, place several (the more the better)metallic decoys weighing 15 to 20 pounds each at various depths and distances about your cache. Since steel weighs about 500 pounds per cubic foot, you will not need a large volume. Such decoys may be solid metal, fragments, nails or bolts. (4) In addition to these larger decoys, scatter metallic debris liberally over the whole area. You may extend the life of decoys by coating them with pitch, epoxy or burying in plastic containers to prevent oxidation and dispersion. (5) If isolated land is not available, the next best location is in the basement or floor slab of your home.

After you have secreted your cache and placed decoys, then it is a good idea to borrow or rent a metal detector and check the adequacy of your

countermeasures. It is simple to make such a check and reassuring to know that your cache does not give a detection signal larger than your decoy.

SOME GENERAL CONSIDERATIONS

Assets should be distributed among several locations since a looter who finds one cache may leave satisfied. Too, if a looter forces you, you may give up a cache more easily if it represents only a part of your total assets. When selecting a cache site, massive defenses and complicated schemes are inferior to guile, subterfuge and innovation. The most impregnable fortress is the one which is not noticed by anyone who would breach its security.

Make absolutely certain you know exactly where you cache an asset. Locate several landmarks to use in orienting for retrieval of your property. Since legal property descriptions have survived troubled times in the past, it is a good idea to reference legal features such as boundary markers. A map, while its existence and possession is a disquieting responsibility, if referenced to a feature known or recognized only by a very close associate (or heir), is invaluable in assuring recovery.

While there is justification for having a confidant to your plans (everyone ought to have at least one trustworthy friend), I recommend that you be absolutely candid with no one. Always reserve some asset at a location known only to yourself. It is not reassuring to consider, but it is conceivable that everyone you trust may betray you.

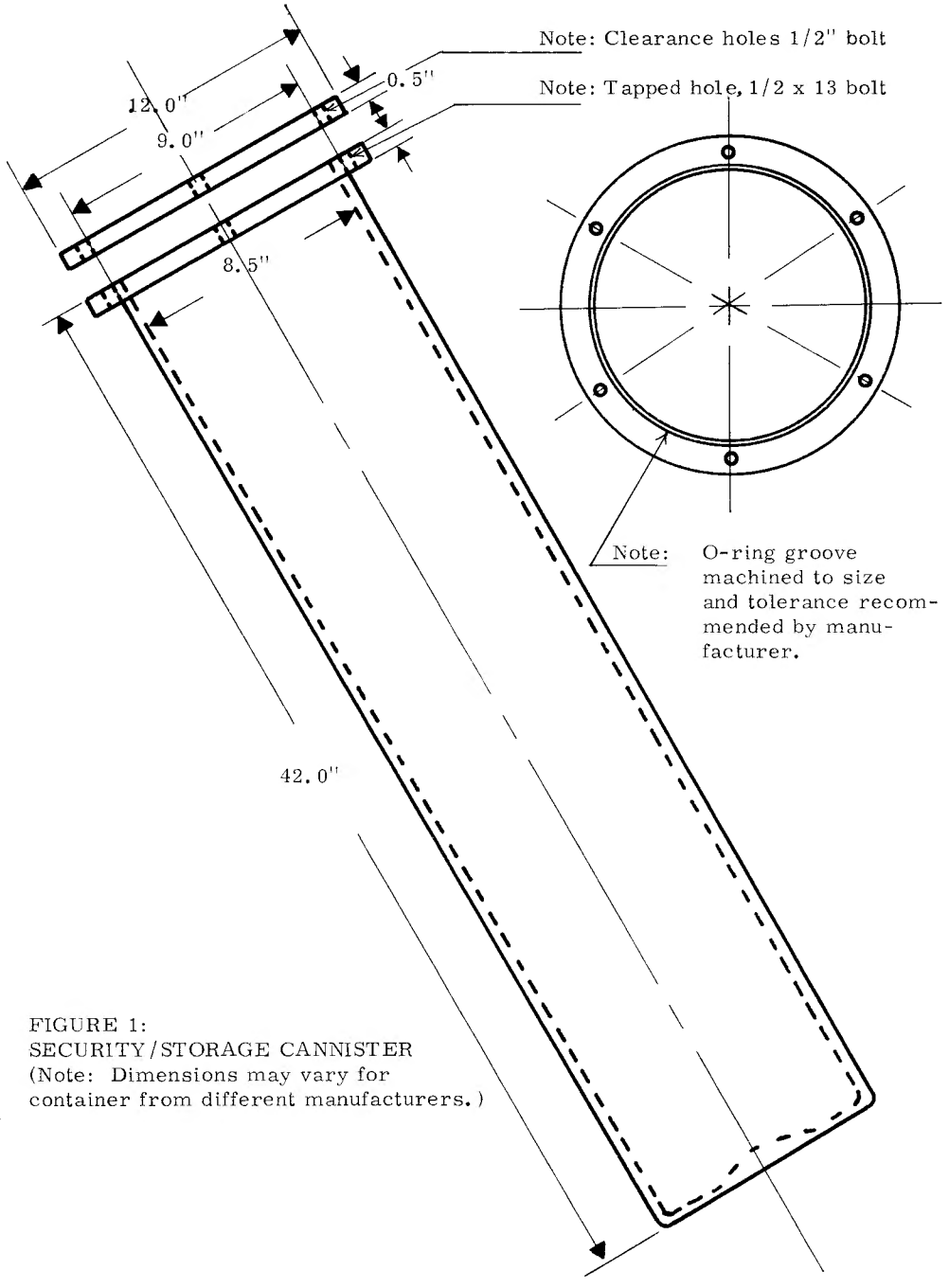

FIGURE 1:
SECURITY/STORAGE CANNISTER
(Note: Dimensions may vary for container from different manufacturers.)

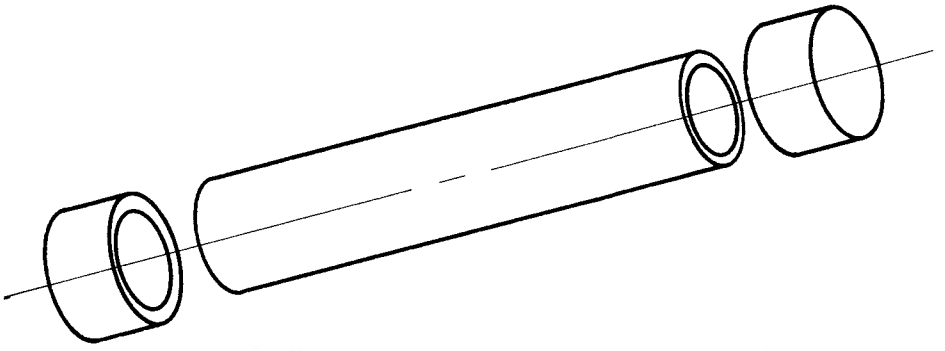

FIGURE 3: ABS Plastic Security/Storage Container

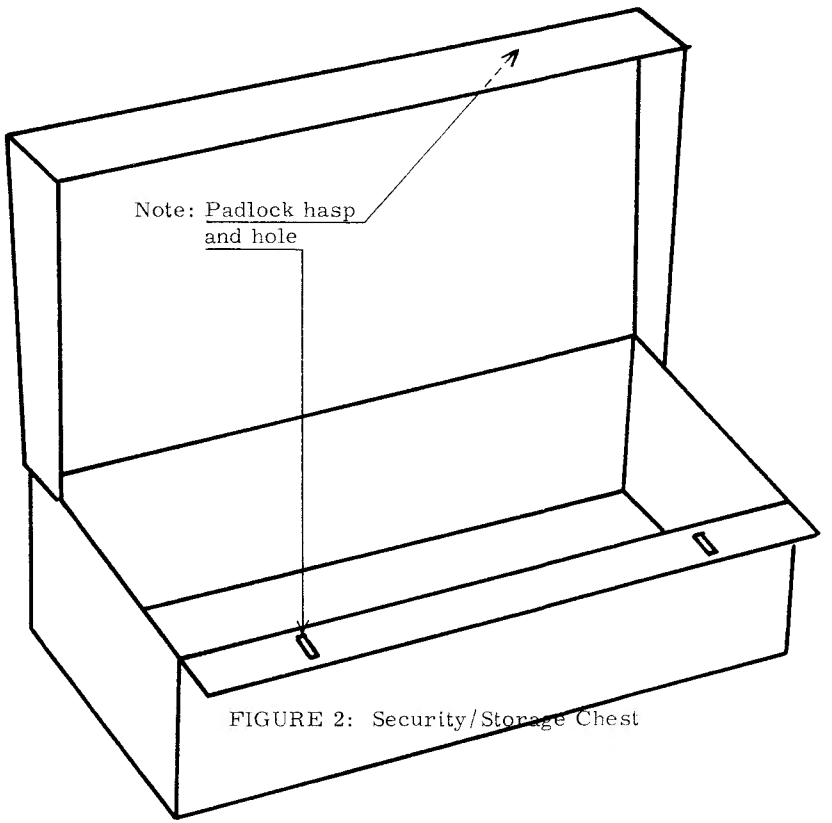

FIGURE 2: Security/Storage Chest